Innovative Technology Program
List of Designated Innovative Technologies
March 1996

Identifying and encouraging the use of environmentally beneficial technologies in Texas

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NOTE: Inclusion of a technology on this list does not grant or imply any approval or endorsement of the technology by the TNRCC, and does not guarantee that the technology will ultimately receive a permit or approval for use in any specific application.

Acoustic Pyrometer -- Device for real-time monitoring of temperature in enclosed spaces and of flows in ducts using acoustics.

Activated Carbon/Polymer Filtration Media -- Activated carbon and a polymer are combined to form a filtration media to remove organics from water and air streams. The combination potentially extends the life and efficiency of the filtration media, thus potentially reducing overall costs.

Advanced Facultative Anaerobic Wastewater Lagoons -- Pond systems employing designs which create aerobic and anaerobic zones to treat waste waters, with reduced sludge production and low maintenance requirements.

Base Catalyzed Decomposition Technology -- Used to treat chlorinated contaminants in soil or sludges using a thermal desorption unit with a patented catalyst. Vapors are further treated in a non-oxidizing atmosphere in the pressure of a catalyst.

Biotreatment -- The use of biological techniques to reduce or eliminate organic constituents. Applies to treatment of liquid, gaseous or solid phase media, and to ongoing treatment of manufacturing by-products as well as remediation activities.

Catalytic Decomposition of Air Pollutants -- Decomposition of ozone and carbon monoxide or other air pollutants by catalytic action. Application for mobile and stationary sources.

Catalytic Extraction Process -- The use of a molten metal catalyst to break down waste materials into elemental components. Three phases of breakdown -- metals, ceramics, gases -- each have recycling potential.

Clear Span Roofs for Internal Floating Roof Tanks -- Clear span roof for initial construction or tank conversion to internal floating roofs, resulting in reduced emissions and elimination of contaminated storm water.

Continuous Particulate Monitor -- A technology which quantifies particulate air emissions and emission rates on a real time basis.

Critical Fluid Solvent Extraction -- Uses a liquefied gas such as propane, butane, or carbon dioxide to extract organics from solids, sludges, and wastewaters. This technology was tested under the EPA SITE program.

Drip Irrigation of Waste Water -- Controlled low flow subsurface irrigation of wastewater. Biotreatment occurs within the soil matrix. This method offers potential solutions for small to medium volume discharges where soils and other factors prevent the use of more conventional technologies.

Electro Magnetic Induction Profiling -- A site investigation method for mapping the subsurface using electromagnetic resonance. A less invasive method than using numerous well bores.

Electrocoagulation -- The passing of electrical current through water to cause the destabilization and aggregation of smaller particles of contaminants into larger particles, thus facilitating settling or separation.

Emissions Control Equipment for Loading Operations -- Use of a hose coupling assembly with drip-free design that mimimizes exposure of fluids and vapors to the atmosphere.

Fiber Optic Chemical Sensor -- Detection of hydrocarbons in water or vapor through the use of modulation of light transmitted along a specially treated optical fiber.

Field Analysis Of Lead -- Portable detection and quantification of lead in paint, soil, dust, air filters, or water.

Field Test For Hydrocarbons Using Colorimetric Test Method -- A variation on the Friedel-Crafts alkylation reaction is used to colorimetrically determine the presence of a broad range of aromatic hydrocarbons.

High Efficiency Oil/Water Separator -- Improved design and/or materials of construction for oil/water separation units increases the effectiveness of oil/water separation.

High Pressure Reverse Osmosis -- The passing of a contaminated water stream over a selectively permeable membrane at high pressure. Purified water passes through the membrane, contaminants are retained.

Horizontal Drilling -- Horizontal directional drilling used to increase surface area of contact to remediate subsurface contamination.

Hot Water-Soluble Disposable Clothing -- Disposable clothing which when contaminated can be dissolved in water and discharged to a water treatment system rather than going to a landfill.

Hydrocyclone Vapor Extraction Of Waste Water -- An air sparged hydrocyclone device for the removal of volatile organic carbons from a waste water stream. The process provides an alternative to conventional clarifiers and dissolved flotation units.

Immunoassay Analytical Test -- Immunoassay test kits that utilize antibodies to detect and quantify specific hydrocarbons. Rapid screening of analytical data available in the field enhances the efficiency of site investigation work.

Innovative Automotive Oil Filters -- Automotive filters are typically 40 micron filters. A one micron filter is available which results in a reduced frequency of oil changes, thus potentially reducing the amount of waste oil.

Laser Induced Fluorescence System For Subsurface Investigation -- Cone penetrometers are used to deliver a laser induced fluorescence tool to a subsurface investigation point. The tool gives real time data on hydrocarbon contamination of soil and groundwater as well as geotechnical data.

Lubricating Oil Additive, Molybdenum sulfide -- The addition of molybdenum sulfide to automotive lubricating oils reduces friction and the frequency required for oil changes, thus potentially reducing the amount of waste oil.

Metal Extraction And Vitrification of Inorganic Materials Process -- Lead and zinc are extracted from electroplating sludge (F006), electric arc furnace dust (K061), and spent potliner (K088). Residue is vitrified to convert it into a mineral wool fiber.

Mixed-Oxident Solution for Water Purification -- Solution of chlorine, chlorine dioxide, and ozone to replace chlorine in the disinfection of water or wastewater.

Multi-Layer Sampling of Ground Water -- Equipment or procedures designed to facilitate the discrete sampling of ground water at multiple levels in order to detect stratification of contamination or water quality.

Oil & Gas Exploration & Production Pollution Control -- Innovative methods of recovering volatile and semi-volatile organic compounds from soils, solids, water and air streams, and controlling, breaking down, or recycling those compounds.

Organic Polymer Sorbents for Spills, Cleanup and Maintenance -- An organic polymer which is used as a sorbent for hydrocarbons and results in a solid mass which is non-biodegradable and resists leaching under pressure.

Ozone used to Clean Laundry -- Specialized equipment has been developed to use ozone in laundering.

Phytoremediation -- The cultivation of selected plants to remove/uptake soil contaminants and restore fertility to the surface layer of contaminated sites.

Plastic Lumber -- A product made from recycled plastic and fiberglass simulates the appearance and size of standard lumber, as well as being able to be sawed, nailed, and otherwise fastened in the same manner and using the same tools as conventional wood products.

Porous Inert Media Oxidation -- Oxidation of VOC contaminants in an air stream within an inert ceramic matrix.

Predictive Emission Monitoring -- A software system which enables the instantaneous and cumulative calculation of air emissions based on input from real time process condition monitors. This may serve as an alternative to continuous monitors in some cases.

Prefabricated Containment Structures -- Temporary to semi-permanent buildings which can be easily constructed to allow containment and abatement of emission from normally open air activities.

Process Maximization Software Technology -- Process control software to optimize operating conditions of a process to save energy and reduce air emissions and waste. The system learns the process from real time input and then suggest optimal process settings.

Radio Frequency Heater -- Use of radio frequency technology in application wells for remediation of contaminated soil and underground waste.

Recycled Water Cleaning Systems -- A high pressure water system for cleaning equipment, pavement, and slabs which is able to collect and recycle the cleaning water.

Removal & Destruction Of HOG From A Gas Stream -- A specialized solution is used with an air stripper to remove halogenated organic compounds from an air stream. The solution is then regenerated and halogens are removed from the system as a salt.

Remote Sensing of Automotive Emissions -- A remote sensing equipment to obtain "on-road" emissions of vehicles as they pass a predeterminted point. The vehicle passes a light beam which activates infrared equipment to measure exhaust pollutant, speed of the vehicle, and read the license plate.

Slow-Release Oxygen Enhancing Agent -- Technology for the controlled release of oxygen over time to enhance the degradation of in-situ contamination.

Soil Washing -- The use of an aqueous phase and mechanical action to remove hazardous constituents that adhere physically and chemically to soil particles.

Solid Materials Recycling -- Innovative methods and processes for recycling solid wastes into useful products.

Spray Coating Process using Supercritical Carbon Dioxide -- The use of carbon dioxide at supercritical temperature and pressure in place of solvents as the delivery medium for spray coatings. Results in reduced VOC emissions.

Super Critical Water Oxidation -- Flameless oxidation of pumpable organics using water at critical temperature and pressure.

Tapered Flange and Seal Ring Pipe Connectors -- Tapered design increases length of seal surface, reduces leaks, increases seal integrity.

Temperature Controlled Evaporative Cooling -- Computer controlled roof misting system delivers evaporative cooling to building, resulting in a reduction in energy usage for air conditioning.

Thermal Desorption -- A thermal process for evaporation of organic and volatile contaminants off of a solid matrix in a non-oxidative atmosphere, thus allowing the recovery of the organic material.

Thermal Oxidation of Air-Stream Contaminants -- A thermal oxidation system for air stream contaminants which oxidizes pollutants (VOC and hydrocarbons) inside a bed of high-temperature silica gravel.

UV/Ozone Treatment of Waste Water -- The combined use of ultraviolet light and ozone to chemically oxidize organic contaminants in an aqueous stream.

Vacuum Distillation of Wastewater -- Distillation of wastewater under negative pressure to separate and remove volatile organic contaminants.

Vertical Activated Sludge Process -- An activated sludge waste water treatment process which circulates water within a sealed bioreactor shaft up to several hundred feet in depth.

Waste Gasification -- A process for the production of low-BTU gas, diesel, asphaltic materials, or ammonia from a variety of feedstock, such as sorted municipal and commercial garbage, shredded paper, wood waste, dewatered sewage sludge, scrap tires, agricultural waste, etc.

Wastewater Treatment Using Hydrogen Peroxide -- The chemical oxidation of organic constituents in wastewater using hydrogen peroxide as the oxidant.

Zeolite Fertilizer -- Fertilizer with nutrients incorporated onto a natural zeolite mineral, which increases plant growth, and reduces the salts released to the soils and ground and surface water over conventional fertilizer.